



COMPUTER PRODUCTS

JULIUS JETTELSON


Regional Sales Manager

NEW YORK REGIONAL OFFICE
300 Northern Blvd., Room 1
Great Neck, (L.I.) New York 11021

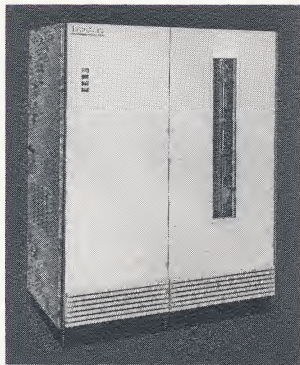
Phone: 516 • 466-0266
TWX: 510 • 223-0802

A DIVISION OF EX-CELL-O CORPORATION





Simultaneous multiple
write/read access to more
than 42-million bytes!



BRYANT
PhD RANDOM ACCESS
MASS STORAGE DRUMS

BRYANT PhD: first mass storage drums

multiple write/read access to their entire

PhD—Positioning head Drum: Visualize a cylindrical drum upon whose surface millions of data bits can be magnetically recorded in thousands of separate tracks. Mounted vertically around this revolving drum are one, two, three or four groups of discretely positionable write/read heads—each controlled in such a manner that corresponding heads in each channel of communication can gain access to the same information store simultaneously or to different data stores independently.

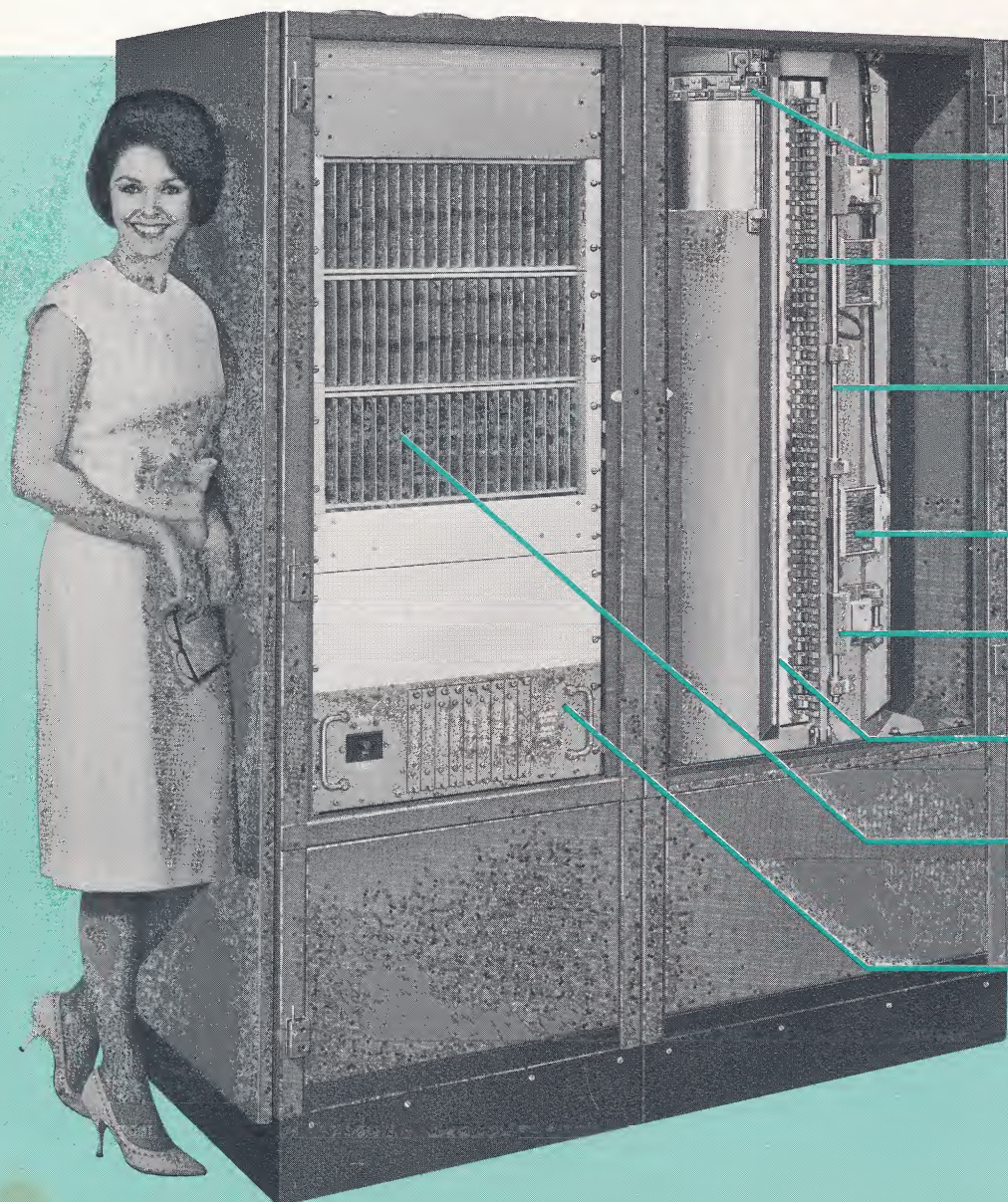
This, in brief, is the Bryant PhD—an entirely new breed of random access mass memory so unique in concept, so reliable and versatile in operation that they can be used for a whole new range of advanced on-line applications. For example: As a massive information storage and retrieval system for inventory control, banking, stock market transactions, actuarial calculations, directory references—airline reservations and

telephone switching systems—buffer storage for scientific and edp computers, process controllers and data communication terminals—computer memory back-up, just to mention a few.

Two basic models with capacities and options to meet your present and future requirements

Bryant PhD random access mass storage drums are available in two basic models—the PhD-170 capable of storing over 21 million bytes (170 million bits), and the PhD-340 with storage capacity for more than 42 million bytes (340 million bits). Both models offer truly low cost random access to their entire information contents. And both incorporate features and capabilities never before available in any single storage device:

☐ Random access storage with simultaneous write/read access to all data through four independently positionable channels.



Fast-Access Heads—14 non-positioning heads are provided to serve various fast-access data, register, or clock functions.

Write/Read Heads—Positionable high density aerodynamic "flying" Uni-Just® heads proved by years of reliable service in many Bryant Auto-Lift® Drums.

Head Positioning Bar—Up to four access channels—with up to 43 write/read heads each—can either address the same information data store simultaneously or up to four different data stores independently.

Signal Preamplifiers—Provide a gain factor of approximately 5 to the playback values fed to the read amplifiers.

"Safe-Set" Head Interlock—A simple automatic fail-safe actuating device that assures non-contact start/stop operation.

Magnetic Storage Drum—Smooth, hard plated surface is special high density, high reliability magnetic recording material.

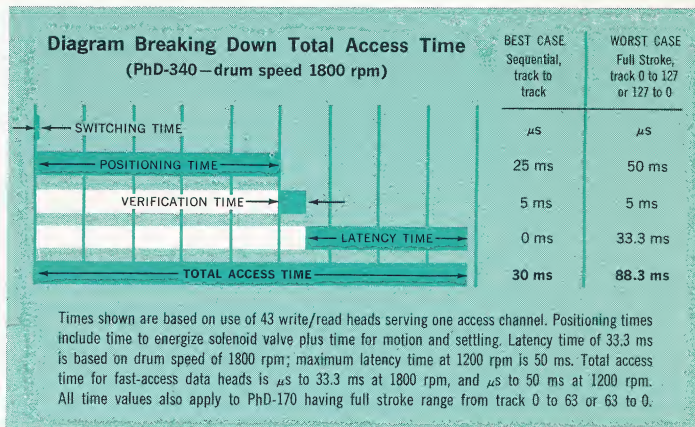
Electronics Interface—Write, read, head select, and logic electronic circuit modules are available in standard or special systems designed to meet your exact requirements.

Address Preamplifier—Standard unit provides address signal amplification for two positionable access channels.

capable of providing independent simultaneous information contents — up to 340 million bits!

- Multiple channels of communication within a single device provides for graceful degradation and superior data integrity.
- Very rapid access—each communication channel of 43 heads can provide nearly 340,000 bytes of data without positioning.
- Extremely high transfer rates—up to 1.8 megabytes per second; capable of performing over 200,000 transactions per hour.
- Increases computing power of data processing systems; improves sorting rates, thruput and price/performance ratios.
- Reduces or eliminates need for sophisticated programming techniques—such as “revolving” and “ping-pong” programs.
- Permits multiple computer operation without resorting to complicated time-sharing, status switching, programming, etc.
- Outstanding sequential processing as well as random storage retrieval. Balanced input/output for high speed processors.
- Extremely fast dump rate—21 million bytes in 15 seconds.

See reverse side for detailed characteristics Phd-170 and Phd-340.

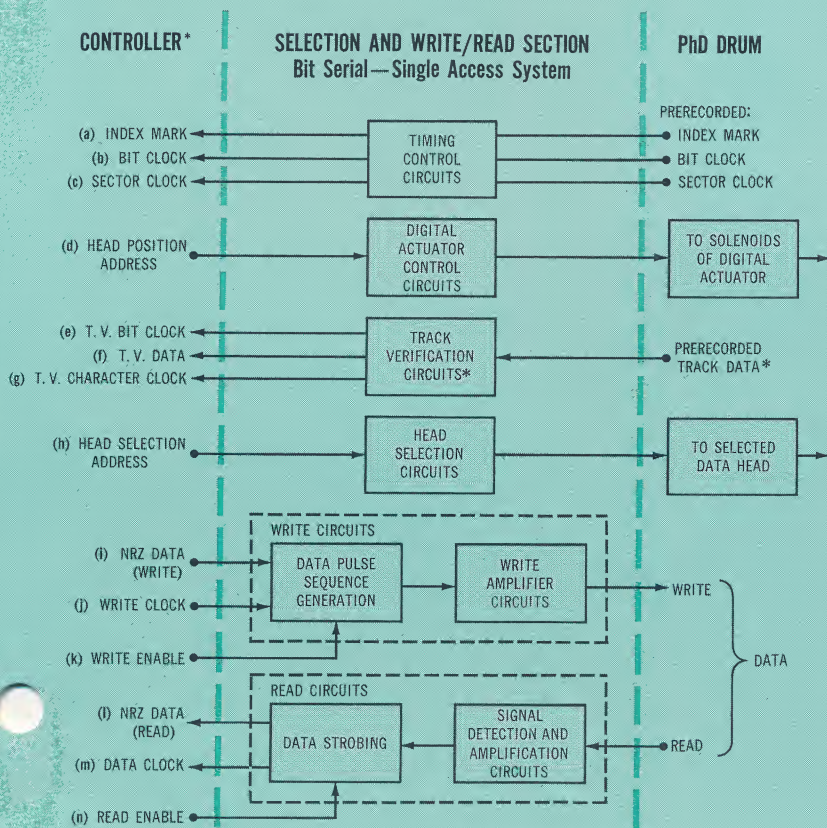


BRYANT PhD ELECTRONIC INTERFACE SYSTEMS

Electronic interface systems consisting of standardized circuit modules are provided as an integral part of each Phd to permit direct plug-in use with computers and data processing equipment.

Such systems are comprised of two function sections. The head selection and write/read section shown in the diagram below is

furnished with and common to all Phd mass storage drums. The controller section—optional at extra cost—is specially designed to meet interface requirements and control functions necessary for communication with input/output channels of the electronic data processor. These functions generally include (1) acceptance and storage of all required Phd addresses—(2) acceptance and generation of a bit parallel data format suitable for an input/output channel—and (3) synchronization of all write/read signals.



*Optional at additional cost.

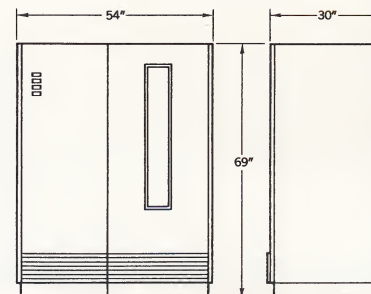
DEFINITION OF SIGNALS

- (a) Index Mark—one bit per revolution (one line).
- (b) Bit Clock—original source of all data clocks (one line).
- (c) Sector Clock—as prescribed by data format (one line); typically, 32 blocks per track with 192 bytes† per block.
- (d) Head Position Address—binary code (Phd-170 six lines; Phd-340 seven lines).
- (e) Track Verification Bit Clock*—one bit per track verification data bit (one line).
- (f) Track Verification Data*—binary code duplicating head position address (one line).
- (g) Track Verification Character Clock*—defines track verification characters (one line).
- (h) Head Selection Address—four lines—12 lines (X-Y matrix).
- (i) NRZ Data (write)—formatted either in the processor or in the control unit section to meet the system requirements (one line).
- (j) Write Clock—one clock bit per data bit (one line).
- (k) Write Enable—enables data writing sequence (one line).
- (l) NRZ Data (read)—same as (i) (one line).
- (m) Data Clock—same as (j) (one line).
- (n) Read Enable—gates data to the interface (one line).

†One byte equals eight bits.

*Optional at extra cost. These track verification signals verify that the heads of a communications channel have been positioned to the track designated by the head position address.

CHARACTERISTICS OF BRYANT PhD RANDOM ACCESS MASS STORAGE DRUMS



PARAMETER	PhD-170	PhD-340
Drum length.....	43 inches	43 inches
Drum diameter.....	20 inches	20 inches
Drum speed (nominal).....	1200 (or 1800) rpm	1200 (or 1800) rpm
Time to reach operating speed.....	10 minutes	10 minutes
Channels per drum.....	4 max.	4 max.
Moving data heads—per channel.....	43 max.	43 max.
—per drum.....	172 max.	172 max.
Data tracks served by moving data heads.....	2752 max. (1)	5504 max. (1)
Moving data heads per track.....	4 max.	4 max.
Fast-access, register or clock heads—per drum.....	14 (2)	14 (2)
Maximum Storage Capacities:		
General data—per track.....	62,800 bits, or 7,850 bytes (3)	62,800 bits, or 7,850 bytes (3)
—per drum.....	172,825,600 bits, or 21,603,200 bytes	345,651,200 bits, or 43,206,400 bytes
Fast-access data, register or clock—per track.....	62,800 bits, or 7,850 bytes	62,800 bits, or 7,850 bytes
—per drum.....	880,000 bits, or 110,000 bytes	880,000 bits, or 110,000 bytes

NOTES—(1) With the maximum capacity configuration, a total of 14 tracks are available for fast-access data, register and clock functions. (2) To provide a larger fast-access capacity, one fast-access data, register and clock track can be added

PARAMETER	PhD-170	PhD-340
Recording mode.....	Self-clocked, frequency modulated	Self-clocked, frequency modulated
Pulse repetition rate (nominal)		
—at 1200 rpm.....	1.2 megacycles	1.2 megacycles
—at 1800 rpm.....	1.8 megacycles	1.8 megacycles
Pulse density.....	1,000 bits per inch	1,000 bits per inch
Playback (from preamplifiers).....	20 millivolts (avg.)	20 millivolts (avg.)
Record length.....	Variable	Variable
Full load/unload—one channel, in byte mode—at 1200 rpm.....	20 seconds	40 seconds
—at 1800 rpm.....	15 seconds	30 seconds
Transfer rate—at 1200 rpm.....	1.2 megabytes/second	1.2 megabytes/second
—at 1800 rpm.....	1.8 megabytes/second	1.8 megabytes/second
Power requirements.....	208-volt, 3-phase, 60-cycles (4)	208-volt, 3-phase, 60-cycles (4)
Power demand—at 1200 rpm.....	Start: 4 kilowatts Run: 2.3 kilowatts	Start: 4 kilowatts Run: 2.3 kilowatts
—at 1800 rpm.....	Start: 8 kilowatts Run: 3 kilowatts	Start: 8 kilowatts Run: 3 kilowatts
Ambient temperature—operating.....	60° to 90°F.	60° to 90°F.
—non-operating.....	—30° to + 130°F.	—30° to + 130°F.
Ambient humidity—operating.....	10 to 80% relative	10 to 80% relative

for each 1.3 general storage tracks removed from the PhD-170, or for each 2.7 general storage tracks removed from the PhD-340. (3) Values based on 8 bits per byte. (4) Drums can also be supplied to operate on other existing power sources.

BRYANT "TOTAL PRODUCT ASSURANCE"

One reason why Bryant has become the world's leading independent producer of memory drums and disc files is its concept of "total product assurance." For when you buy Bryant equipment, you can be sure that:

- (1) Its design is based upon proven operating and performance principles.
- (2) Every outside purchased component is the very finest obtainable.
- (3) Every precision part and assembly is controlled to the highest known standard of accuracy and quality. And (4) every finished product has been subjected to thorough computer-simulated testing prior to shipment to assure the ultimate in value and reliability.

Other Bryant customer services include complete installation of equipment by qualified factory engineers, a special training school for instruction of your personnel, and an inventory of spare parts—many having assigned federal stock numbers—to assure prompt field replacements when necessary.



BRYANT
COMPUTER PRODUCTS
XLO
EX-CELL-O CORPORATION

BRYANT COMPUTER PRODUCTS

850 LADD ROAD • WALLED LAKE, MICHIGAN 48088 • TELEPHONE 313/624-4571 • TWX 810/231-7190

NEW YORK REGIONAL SALES OFFICE
BRYANT COMPUTER PRODUCTS

A DIVISION OF EX-CELLO CORP.
300 NORTHERN BLVD. (P. O. BOX 592)

GREAT NECK, N. Y. 11021

PHONE 516 - 466-0266

TWX 810-223-0802

NEW!

FIRST CLASS
PERMIT NO. 36
SEC. 510 P.L.R.)
WALLED LAKE
MICHIGAN

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD

POSTAGE WILL BE PAID BY

BRYANT COMPUTER PRODUCTS
850 LADD ROAD
WALLED LAKE, MICHIGAN 48088

ATTN: INFORMATION SERVICES



BRYANT
COMPUTER PRODUCTS



EX-CELL-O CORPORATION

May we help you further?

I would like additional information concerning:

Please have your salesman call for an appointment ☐

Name:

Title:

Company:

Address:

Phone: